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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,597	03/29/2004	Ravi Prasher	P18285	2876

28062 7590 03/08/2007  
BUCKLEY, MASCHOFF, TALWALKAR LLC  
50 LOCUST AVENUE  
NEW CANAAN, CT 06840

EXAMINER
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DINH, TUAN T

ART UNIT	PAPER NUMBER
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2841

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

10/811,597

**Applicant(s)**

PRASHER, RAVI

**Examiner**

Tuan T. Dinh

**Art Unit**

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 15, 16 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### **Noted of claimed language:**

Ritchie (U.S. Patent 3,232,719) discloses a thermoelectric bonding material (1) made by beryllium telluride, column 2, lines 30-37, column 3, lines 29-35.

### ***Specification***

1. The disclosure is objected to because of the following informalities:  
  
The "Summary of the invention" is missing in the instant application. Please, provide.  
  
Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messina ('200) in view of Lewis et al. (U.S. Patent 5,569,950).

As to claims 1-3, Messina discloses an apparatus as shown in figure 6 comprising: an integrated circuit (IC) die (16) having front and rear surfaces; a member to define at least one microchannel (gap between 22 and 46) defined a groove (46) at

the rear surface of the IC die, the microchannel to allow a coolant to flow therethrough (column 3, lines 34-36).

Messina does not disclose at least one thin film thermoelectric cooling (TFTEC) device in the at least one microchannel and formed on a surface of the die.

Lewis shows a thin film TEC device (18) formed between a heat sink (10) and a chip (12), see column 2, lines 34-46

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a TFTEC as taught by Lewis employed in the apparatus of Messina in order to provide active temperature control and reduce a leakage power consumption.

As to claim 4, Messina discloses the member is an integrated heat spreader.

As to claims 5-7, Messina discloses the member is formed of copper, or silicon, see column 3, lines 24-27.

As to claims 8-9, Messina discloses the coolant includes water or de-ionized water (column 3, lines 34-35).

As to claim 11, Messina discloses the member is bonded to the rear surface of the IC die.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Lewis as applied to claims 1-9, 11 above, and further in view of Ritchie (U.S. Patent U.S. Patent 3,232,719).

Regarding claim 10, Messina as modified by Lewis does not disclose the TFTEC device made by BeTe.

Ritchie (U.S. Patent 3,232,719) discloses a thermoelectric bonding material (1) made by beryllium telluride, column 2, lines 30-37, column 3, lines 29-35.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a TFTEC made by BeTe as taught by Ritchie employed in the apparatus of Messina and Lewis in order to provide excellent bonding and reduce cracking due to different CTE mismatches.

5. Claims 15, 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Lewis as applied to claims 1-9, 11 above, and further in view of Jaeck (U.S. Patent U.S. Patent 6,794,760).

As to claims 15, 23-25, Messina and Lewis as modified discloses all of the limitations of the claimed invention, Messina discloses the IC die is connected to a substrate (12).

Messina as modified by Lewis does not specific disclose the connection of the IC to the microprocessor.

Jaeck shows a connection between a chip (20) on a surface of a microprocessor (30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a microprocessor connected to a chip component as

taught by Jaeck employed in the apparatus of Messina and Lewis in order to processing data.

Regarding claims 27-28, Messina as modified by Lewis and Jaeck shows a coolant circulation system and a power supply (the system and the power supply are inherently because without the power supply then there is no power to operate the system) to the microchannel and a TFTEC device.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Lewis as applied to claims 1-9, 11 above, and further in view of Otey (U.S. Patent 6,410,971).

Regarding claim 16, Messina and Lewis do not disclose the at least one TFTEC device includes at least one pair of stacked TFTEC devices.

Otey shows a flexible thermoelectric module (10), see figure 1 having a pair of flexible substrate (12, 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a pair of TFTEC as taught by Otey employed in the apparatus of Messina and Lewis in order to provide excellent bonding and reduce cracking due to different CTE mismatches.

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Messina in view of Lewis and Jaeck, and further in view of Ritchie

Regarding claim 26, Messina as modified by Lewis and Jaeck does not disclose the TFTEC device made by BeTe.

Ritchie (U.S. Patent 3,232,719) discloses a thermoelectric bonding material (1) made by beryllium telluride, column 2, lines 30-37, column 3, lines 29-35.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a TFTEC made by BeTe as taught by Ritchie employed in the apparatus of Messina, Lewis, and Jaeck in order to provide excellent bonding and reduce cracking due to different CTE mismatches.

#### ***Allowable Subject Matter***

8. Claims 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

9. Applicant's arguments with respect to claims 1-16 and 23-28 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prasher and Chen et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reichard Dean can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Tuan Dinh', with a long, sweeping horizontal stroke extending to the right.

Tuan Dinh  
March 01, 2007.